Claims

1. An image projection system, comprising:

a projection lens;

a dichroic cross-combiner assembly having sides with one side facing the projection lens;

three reflective imaging devices, each reflective imaging device positioned facing a side of the dichroic cross-combiner assembly; and

a light source apparatus generating narrow bands of blue, green, and red light and positioned such that the three reflective imaging devices respectively receive the blue, green, and red light and reflect the blue, green, and red light through the dichroic cross-combiner assembly toward the projection lens.

2. The image projection system of claim 1 in which the light source apparatus comprises three colored light sources that respectively provide the narrow bands of blue, green, and red light.

3. The image projection system of claim 2, further comprising three pairs of lenses, each pair including an anamorphic beam expanding lens and an anamorphic collimating lens, each pair being positioned between one of the three colored light sources and one of the three reflective imaging devices.

4. The image projection system of claim 2 in which the three colored light sources include light-emitting diodes.

5. The image projection system of claim 2 in which the three colored light sources include lasers.

6. The image projection system of claim 1 in which the light source apparatus comprises a multicolor light source that generates the narrow bands of blue, green, and red light.

7. The image projection system of claim 6, further comprising a pair of lenses, the pair including an anamorphic beam expanding lens and an anamorphic collimating lens, the pair being positioned such that the light passes through the pair before being received by the three reflective imaging devices.

8. The image projection system of claim 1 in which each reflective imaging device is a micromirror display comprising an array of digitally deflected mirrors that are each quadrilateral and pivotable about a diagonal axis.

9. The image projection system of claim 1 in which each reflective imaging device is a micromirror display comprising an array of digitally deflected mirrors that are each quadrilateral and pivotable about a longitudinally centered axis.

10. The image projection system of claim 1 in which the light source apparatus is positioned such that the three reflective imaging devices respectively receive blue, green, and red light at an oblique angle of incidence.

11. The image projection system of claim 1 in which each reflective imaging device and the projection lens are positioned in a first plane and the light source apparatus delivers light from a second plane.

12. The image projection system of claim 1 in which the light source apparatus is positioned below the dichroic cross-combiner assembly.

13. The image projection system of claim 1 in which each reflective imaging device includes reflective pixels that are adapted to selectively reflect the blue, green, and red light towards one of the projection lens or a light-absorbing surface in proximity to the projection lens.

14. The image projection system of claim 13 in which the light-absorbing surface is positioned on a frame around the projection lens.

15. The image projection system of claim 1 in which the dichroic cross-combiner assembly includes an X-cube.

16. The image projection system of claim 1 in which the sides of the dichroic cross-combiner assembly are rectangular.

17. The image projection system of claim 1 in which the dichroic cross-combiner assembly comprises two X-cubes.

18. The image projection system of claim 1 in which the dichroic cross-combiner assembly is adapted to simultaneously receive the blue, green, and red light from the respective reflective imaging devices and to combine the blue, green, and red light to form a composite image directed toward the projection lens.

19. The image projection system of claim 1, further comprising three field lenses, in which each field lens is positioned between one of the three reflective imaging devices and one of the sides of the dichroic cross-combiner assembly.

20. The image projection system of claims 1 in which the narrow bands of blue, green, and red light each have a full-width half-maximum spectra of less than about 40 nanometers.

21. A method for projecting color display information, comprising:

directing blue, green, and red light respectively toward three reflective imaging devices;

reflecting the blue, green, and red light from the three reflective imaging devices into a dichroic cross-combiner assembly;

simultaneously combining the blue, green, and red light from the respective reflective imaging devices in the dichroic cross-combiner assembly to form a composite image; and

directing the composite image toward a projection lens.

22. The method of claim 21 further including obliquely directing the blue, green, and red light toward the three reflective imaging devices.

23. The method of claim 22 further comprising expanding and collimating the blue, green, and red light before the blue, green, and red light reaches the three reflective imaging devices.